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The Language of Thinking

BY SHARI TISHMAN AND
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Although thinking involves much more than we can say, we would have far less access to that "more" without the language of thinking, according to Ms. Tishman and Mr. Perkins.

WHAT COMES first, a word or a thought? The relationship between thinking and language has intrigued scholars and artists for centuries. Anticipating Lev Vygotsky's view that thought is not only expressed in words but comes into existence through them, Emily Dickinson took this stand:

> A word is dead
> When it is said,
> Some say.
>
> I say it just
> Begins to live
> That day.[1]

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Illustration by Kris Hackleman

Words and thoughts live through each other. One interesting realm in which to examine how this happens is that of the special class of words we have for talking *about* thought — words for talking about the thinking processes that lead to products of thought such as ideas and theories. What is this "language of thinking" — what is its lexicon, what is it for, how does it work, and what role does it play in human development and education? We hope to shed some light on these questions by exploring the various ways we talk about thought and by looking at how, to borrow Emily Dickinson's phrase, the language of thinking makes thinking "begin to live" by shaping and regulating conceptual development.

What Is the
Language of Thinking?

The language of thinking embraces the many ways we describe our own and others' mental states and mental processes. For example, we use the language of thinking when we talk about the thinking processes involved in developing a theory, examining a claim, making a decision, or creating a work of art. We use the language of thinking when we characterize others' mental states by saying things like: Julia believes that everyone should vote; Juan thinks that it will snow; Martin concluded that he doesn't like papayas; I suspect that you're telling the truth.

The English language has a remarkable number of finely nuanced terms for describing thinking. For example, consider the words *guess, suppose, surmise, assume,* and *speculate.* All of them concern forming an opinion based on inconclusive evidence. At the same time, each term suggests a subtle but important difference in the relationship of evidence to opinion. For another example, consider the words *contemplate, ruminate, reflect,* and *ponder.* Each of these terms describes a form of slow and deep cerebration, yet each carries its own distinct meaning.

The vocabulary of thinking can be roughly divided into terms that fill three different functions: terms that mark an epistemic stance,[2] terms that describe an intellectual process, and terms that describe an intellectual product.

Epistemic-stance terms indicate a stance or attitude toward a claim to knowledge. Examples include such terms as *conjecture, conclude, believe, confirm, doubt, know,* *suggest, speculate, suspect,* and *theorize.* To see how these terms function as stance indicators, consider the claim "Grasshoppers dream in color" and the following sentences.

• I believe that grasshoppers dream in color.

• I have confirmed that grasshoppers dream in color.

• I suspect that grasshoppers dream in color.

• I am certain that grasshoppers dream in color.

Each of these sentences takes a quite different stance toward the truth of the claim. And it is the stance markers that provide essential information about how the claim should be taken.

Epistemic-stance terms function by characterizing the relationship of thought to fact. Intellectual-process terms characterize the *process* of thinking and express its flow, structure, and feel. Intellectual-process terms include such words as *analyze, contemplate, discern, interpret, investigate, ponder, examine,* and *recollect,* to name but a few. What is distinctive about intellectual-process terms is that they discriminate among *ways* of thinking. To say that one is pondering something is to characterize one's thinking in quite a different way than to say that one is analyzing, reviewing, considering, or investigating something. As is the case with epistemic-stance terms, the nuances of meaning of intellectual-process terms are subtle (*ponder* versus *ruminate,* for example).

Intellectual-product terms are nouns that name and mark differences among kinds of ideas — ideas that are typically the outcome of a thinking process or that play a particular role in a thinking process. The word *idea* is itself a loosely defined intellectual-product term that is frequently used to cover a range of mental outcomes, from solutions to insights to suggestions to intuitions. But the word *idea* tends toward the generic, and, when specificity is desirable, we have plenty of intellectual-product terms at our disposal that differentiate among kinds of ideas or outcomes — terms such as *conclusion, hypothesis, option, solution, reason, claim,* and *theory.*

Naturally, the functions of these three groups of terms are related: intellectual processes tend to yield epistemic stances, which in turn yield intellectual products. For example, by musing or speculating, one is often led to assert, dispute, or assume things, and eventually led to make a claim, propose a theory, or draw a conclusion. Because these three categories name different linguistic functions rather than different groups of words, the terms in each category often overlap, and the same word can play different roles, depending on whether it functions as a noun or a verb and whether, as a verb, it is used to indicate an epistemic stance or an intellectual process. For example, the sentence "I doubt that x" indicates a stance toward a proposition. But the word "doubt" could also be referring to a mental process, for example if the speaker's intended meaning is actually "I am in the process of doubting x." And of course the term "doubt" can also be used as a noun to describe a particular sort of intellectual product, as in "I have my doubts" or "she raises an important doubt."

Complicated as it is to analytically disentangle the linguistic functions of language-of-thinking terminology, it is testimony to the efficacy and elegance of the language of thinking that we very easily understand these different functions when we experience them in context. For example, consider the sentence: *Claire doubted whether Michael's claim was true, but she recognized the need to investigate it further.* We have no trouble at all understanding that Claire's epistemic stance is one of doubt, that the intellectual product she is referring to is Michael's claim, and that the intellectual activity she plans to undertake is to investigate Michael's claim.

As the foregoing example suggests, the language of thinking is rich with terms that specifically and often technically describe mental states and processes — terms such as *analyze, doubt, claim, investigate,* and so on. But the language of thinking also expresses the affective side of cognition — the passions, emotions, motivations, and attitudes that are an integral part of the experience of thinking.

Does thinking really involve feeling? All the time. Consider William James' description of an instance of thinking in which "the transition from a state of puzzle and perplexity to rational comprehension is full of lively relief and pleasure."[3] Puzzlement, confusion, concern, and consternation are all feelings that accompany thinking, as are feelings of joy, delight, relief, thrill, and aesthetic appreciation. Although psychologists and philosophers sometimes dichotomize cognition and af-

fect, the language of feeling is abundantly present in our everyday language of thinking. Mathematicians talk about the pleasure of an elegant proof. Poets talk about the beauty of an image. Scientists talk about the thrill of discovery and the joy of verification. Indeed, the feelings of joy and surprise that often accompany intellectual work play such a distinctive role in thinking that the philosopher Israel Scheffler has described them as "cognitive emotions." Not only do they characterize thinking, he argues, but also they are epistemologically relevant to the practice of reasoning because they provide important information about the thinker's beliefs, predictions, and expectations.[4]

Negative emotions abound in thinking, too. For example, it is said that one of the greatest pains of the human experience is the pain of a new idea. And learning difficult material, as any schoolchild will tell you, can be a torturous task. Thinking well can be tough, and we often feel frustrated and even angry at the difficulties of coming to the right conclusion or decision or belief. Of course, it is possible to avoid the negative emotions associated with thinking. "Abandon learning," says the Chinese philosopher Lao-Tse, "and you will be free from trouble and distress."

Besides expressing emotions, the language of thinking also expresses attitudes toward our own and others' thinking. For example, the critical distance associated with rigorous reasoning is often described attitudinally: we speak of an attitude of objectivity, of detachment, of fair-mind-edness. But there are other possible attitudes toward thinking, too. For instance, we talk about adopting an attitude of sympathy or skepticism toward an argument, of receptivity or resistance to a point of view, and so on.

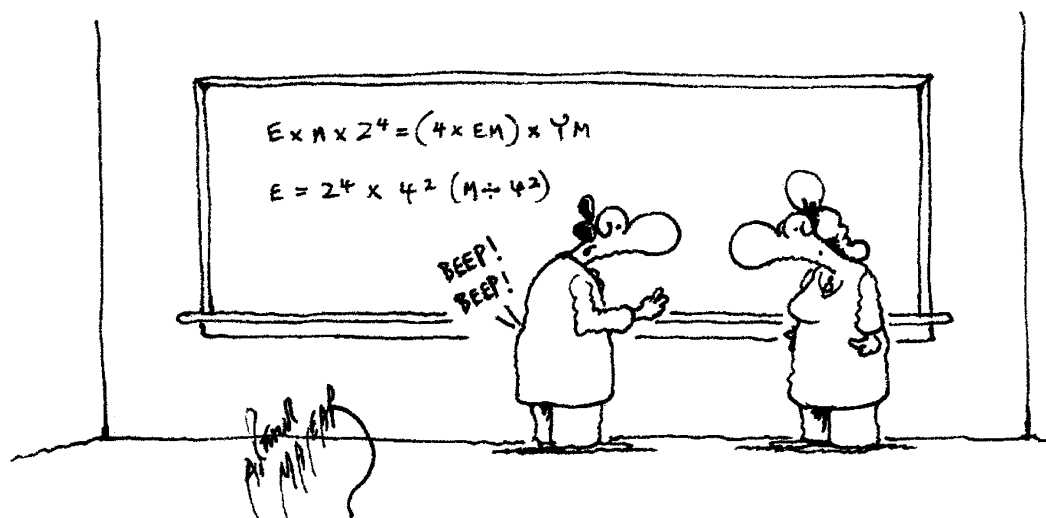## The Communicative Function Of the Language of Thinking

What is the language of thinking *for*? Why have we developed such extensive and nuanced ways of talking about the life of the mind? One obvious and important purpose is communication. We use the language of thinking to communicate information about the character and intent of our mental states and processes in all sorts of everyday contexts. When we explain to a friend the thinking process that led us to choose one candidate over another in a local election, we are using the language of thinking. We do likewise when we explain how we came to hold or reject a particular belief, how we developed an idea, how we made a decision, or how we solved a problem.

Most of the time, the everyday use of the language of thinking is quite informal. But there are more formal venues too, where its terms take on a more technical aspect. For example, scholarly papers that report scientific findings and develop or critique theories use the language of thinking very carefully. In these contexts, it is quite important for the writer to indicate exactly which lines of thought are inferential, which are speculative, what state-ments are meant to be taken as conclusions, what counts as evidence, and so on. Words such as *assume, conclude, suggest, hypothesize, infer, assert*, and so on alert readers to the "epistemic game" being played by the author and indicate the standards by which the ideas put forth should be evaluated.

In a dialect less technical but no less evocative, the language of thinking also communicates the thinking behind creativity. For example, painters, writers, dancers, and other artists often talk about the thinking involved in the creative process. They discuss such things as the genesis of an idea, the source of an inspiration, and the struggle to realize a vision. If their lexicon is not as technical as that of the scholar or scientist, it is because their products of thought — paintings, poems, novels, dances — are not meant to be evaluated primarily as products of reasoning. It makes no more sense to reject a sculpture because its conclusion isn't supported by verifiable evidence than it does to reject a report of a scientific experiment because it isn't aesthetically compelling.

That said, it is important to recognize that inspiration, intuition, and aesthetic considerations can play a large and legitimate role in critical scholarship and that critical reasoning often plays a large and legitimate role in the production of art. The language of thinking duly reports these intertwinings. Thus we sometimes hear scientists discussing the intuitions and aesthetic yearnings that gave rise to a theory and artists talking about the critical rea-

$$E \times \pi \times 2^4 = \left(4 \times E\pi\right) \times \Upsilon M$$

$$E = 2^4 \times 4^2 \left(M \div 4^2\right)$$

"Just a minute — my right brain is paging me."

soning that led them to a particular artistic approach.

The Regulative Function Of the Language of Thinking

The language of thinking does more than help us communicate. It shapes and regulates thought by providing concepts to guide our thinking. Although this view has received special attention in recent decades, the notion that language shapes thought is nothing new. Most people have heard the saying "I can't know what I think until I hear what I say." Vygotsky emphasized the social context of language and its role in shaping conceptual development.[5] Even the ancient Greeks stressed the role of language in thought. Socrates, in the *Theatetus,* described thinking as "a discourse the mind carries on with itself" and judgment as "a statement pronounced . . . silently to oneself."[6]

Just as the colors on an artist's palette influence the painting that emerges, the words we have available to us influence the way we think about the world, including the inner world of our own mental life. In recent years, cognitive psychologists have used the term "metacognition" to refer to the mental processes involved in thinking about one's own thinking. Widely recognized as a key component of high-level thinking and effective learning, metacognition involves stepping back from the flow of one's thought to better understand it, assess it, and guide it.[7] The connection between metacognition and the language of thinking is straightforward: the language of thinking provides the words and concepts with which thought evaluates and regulates itself.

This is both an everyday reality and an educational opportunity. For a touch of the latter, imagine that students in two fifth-grade classrooms are studying the life of Amelia Earhart, and both teachers are conducting a discussion about her mysterious disappearance somewhere in the South Pacific. The first teacher ask his class, "What do you think happened?" One student ventures a guess: "Maybe she wanted to disappear because she didn't like so much publicity." "That's an interesting idea," the teacher responds, then asks another student for her opinion, and then a third student for his.

In the second classroom, the teacher says to his students, "There are several theories about what happened to Amelia Earhart. Do any of you have a theory?" As in the first class, one student suggests that Amelia Earhart deliberately disappeared in order to avoid publicity. "What are your reasons?" the teacher asks. "What evidence do you have to support your view?" The student ponders for a moment, then says, "Well, I guess some evidence is that no one ever found a trace of her or her plane. That's pretty unusual, in plane crashes."

"Are you sure that's supporting evidence?" the teacher asks. And so the discussion continues. This second teacher is using the language of thinking with his students. By introducing them to the terms and concepts involved in theory building, he draws them into a culture of concepts they can use to reflect on their own thinking in what Socrates called "the discourse the mind carries on with itself."

Reasoning is only one of the cognitive processes that invites metacognitive regulation through the language of thinking. For another kind of example, consider the word *brainstorming.* The general notion of generating multiple ideas is nothing new. But for those of us in the last couple of decades who have come to associate the term with a specific set of procedures, the word *brainstorming* invokes certain patterns of ideation — e.g., thinking broadly about possibilities, piggybacking on the ideas-so-far, deferring criticism and critical selection until later, and so on. The term *brainstorming* functions metacognitively when it invokes standards with which we shape and evaluate the thinking that ensues.

Where does metacognitive language come from? Words like *brainstorming* tend to draw their expressiveness from metaphor and analogy. This is true of many of the words and phrases we use to describe creative thought. Consider, for example, the familiar analogies that compare insight to a light bulb going off or describe it as a flash of brilliance. The story line for the metacognitive language involved in critical thinking — the language of reasoning, analysis, and theory building — may be somewhat different. In an interesting and persuasive line of thought, David Olson and Janet Wilde Astington argue that the language for reflecting on critical thinking connects closely to literacy.[8]

Literacy, they propose, affects how we reflect on our own thinking by introducing terms for talking about text (terms that also apply to thinking and talking about one's own cognition). Written language, stabilized on paper, invites kinds of reflection not so natural to oral exchanges. The written statement is more easily examined, checked, contradicted, doubted, challenged, or affirmed. Such processes give rise to a specialized terminology for characterizing text-based thinking. So it is not surprising that much of the terminology of the language of thinking, in English at any rate, comes from Latin, which was introduced into English in the 16th and 17th centuries primarily as a text-based language — the language of legal and official documents. For example, terms such as *assert, assume, criticize, discover, explain, hypothesize,* and *interpret* all have Latinate roots. They represent concepts involved in thinking about and analyzing the thinking in texts, and they can also be applied to thinking about one's own and others' mental states and processes.

Does this mean that only people who read and write well can think metacognitively? Absolutely not. Once such literacy-based concepts become prominent in a language, they are as available for oral as for written exchanges. Witness the critical debates in many classrooms and colloquia. In such contexts, literacy is defined not by scribal competence but by the ability to use literacy-based concepts in thinking and talking. "To be literate," argue Olson and Astington, "is to be competent to participate in a certain form of discourse, *whether one can read or write or not.*"[9]

Dispositions and The Regulative Function

As we emphasized earlier, thinking and learning involve emotions and attitudes in addition to cognitive skill, and good thinking involves being disposed toward certain sorts of affects. In recent years, several researchers have been investigating the dispositional side of thinking and have proposed that teaching high-level thinking involves cultivating students' "thinking dispositions" in addition to teaching thinking skills.[10] Thinking dispositions are tendencies or leanings toward particular patterns of intellectual behavior, such as the tendencies to be reflective, to seek reasons, to be intellectually strategic, or to be intellectually adventurous. Thinking skills alone may show up well on exercises and

> *We can expect long-term effects from the use of the language of thinking.*

tests, but, without dispositions to spur them into actions, they are likely to remain inactive in real-life situations.

Language in general is a cultural force with the power to shape dispositional behavior, and the situation with the language of thinking is no different. The language of thinking supports the development of thinking dispositions in several ways. To begin with, the language of thinking encourages thinking-dispositional behavior by inspiring it in context. To make an analogy, a coach inspires her team's best performance with language that invokes the spirit of competition and excellence, and athletes often psych themselves up for an event by using this same language in talking to themselves. Although most of the time thinking is not a competitive event, the language of thinking has a similar effect. Simply hearing and using certain language in certain contexts invokes thinking-dispositional behavior. For example, the language of planning and strategizing tends to encourage goal-setting; the language of self-reflection tends to inspire introspection.

Beyond episodes of a minute or an hour, we can expect long-term developmental effects from the use of the language of thinking. When thinking-rich language pervades a learning environment — when it sees regular use by teachers and learners, as in the Amelia Earhart example — it provides not only information but also an invitation to embrace and cultivate certain habits of mind. For example, frequent exposure to the language of argumentation, with such terms as *premise, reason, conclusion, evidence, theory,* and *hypothesis,* draws learners into the values and commitments of critical

analysis. The language of creative problem solving, with expressions such as *wild idea, pushing the edge of the envelope, new point of view,* and *breaking set,* fosters the mindset of creative ideation.

Dispositional behavior depends not only on wanting to do the right thing but also on noticing when to do it. Here, too, using the language of thinking in the classroom helps develop learners' sensitivity to occasions for engaging in high-level thinking. Terms like *claim, option, opinion, guess,* and *doubt* alert learners to opportunities to do such things as probe an assumption, seek evidence, identify reasons, or look at a problem from a new point of view.

The Dialects of Thinking

Lawyers speak of precedents, but physicists do not. Physicists do experiments to read the book of nature carefully, while mathematicians rarely mention the word *experiment* and instead seek deductive proof from axioms. Literary reviewers freely report how a work impressed or distressed or inspired or exasperated them as evidence of its meaning and worth, something a lawyer or mathematician would rarely do, or at least rarely admit to doing. We have written of the language of thinking, but plainly there is more than one. Or better, the one has many dialects that vary with the intellectual territory. How can we get a clearer view of these dialects and their significance?

A helpful concept here is the notion of epistemic games.[11] Inquiry of whatever sort tends to involve three broad epistemic pursuits: characterization, explanation, and justification. Any area of inquiry, from literary criticism to quantum physics, includes efforts to characterize something (the favorite theme of an author or the properties of a proposed elementary particle), explain something (What does the theme mean and imply? How does the particle fit with fundamental theory?), and justify something (What is the evidence for the presence of the theme in the author's work? What empirical evidence do we have that the particle exists?). However, the way the epistemic game is played varies from field to field in its typical forms, moves, goals, and rules. Literary criticism, for example, involves the form of one interpretation among others, moves such as advancing and critiquing interpretations, goals such as illumination and soundness, and rules

of thumb about attention to the context, awareness of the authors' likely intentions based on other works and biographical information, and so on — all very different from the forms, moves, goals, and rules of the quantum physicist.

There is a natural connection to dialects of thinking. In everyday thinking, we play a kind of generic epistemic game of characterization, explanation, and justification, communicating and metacognizing about it in plain words like *idea, reason, brainstorm, doubt,* and so on. But the epistemic games of particular fields add more specialized concepts and dialects. For instance, psychologists add to the everyday lexicon phrases such as *null hypothesis, control of variables, fair samples,* and *statistical significance* — concepts that are part of a technical dialect about justification that is especially pertinent to empirical psychology.

The notion of dialects of thinking illuminates two important issues: the generality of thinking and the complexity of learning to think better. As to the first, some scholars have argued that good thinking is profoundly situated.[12] Whatever supports good thinking in quantum mechanics or auto mechanics has little that is general in it. Thinking at its best, and cognition more generally, is an inherently specialized enterprise, contend the proponents of this view. The idea of general, powerful thinking skills and dispositions is misguided. Teaching thinking in any general sense is a waste of time.

While this is a complex issue that we cannot fully examine here, the notion of dialects of thinking suggests a more balanced stance. Plainly, effective thinking in many fields involves being conversant with the dialects of thinking that are important to those fields, both for communication and for metacognitive self-regulation. At the same time, thinking in particular fields and thinking about everyday matters commonly fall prey to hastiness, narrowness, and other hazards.[13] Here the generic language of thinking provides a regulative resource. Such common-coin terms as *argument, evidence, counterexample, other side of the case, point of view,* and so on help to expand and redirect thinking in ways that cannot be taken for granted in either ordinary or technical situations. Effective thinking, in other words, has both general and situated aspects, corresponding to the general language of thinking and

its dialects.

The second theme is the complexity of learning to think better. Many school-based approaches to the teaching of thinking foreground a few strategies for problem solving and decision making and leave it at that. Such efforts often do some good in our view. But they certainly underestimate the scope of the enterprise. Even the everyday language of thinking has many sides to it — and then there are the dialects that serve different specialized styles of inquiry. While only professionals need be deeply versed in those styles, general competence calls for a nodding acquaintance with them. People who have no feel for the control of variables in science, or the "beyond reasonable doubt" principle in legal argument, or the importance of sample size and lack of bias in social research do not understand the rich world of ideas they inevitably live in.

If we are to lead students to an enlightened world of creative and critical thinking, we must do so in recognition that this world is rich in the variety of its challenges and the conceptual and linguistic skills and dispositions needed to meet them. While point-blank instruction in concepts, strategies, and even terminology is helpful, deep and lasting impact calls for an enculturative approach.[14] Only when students spend hours a day in classrooms where the culture and language of thinking are commonplace are they likely to become fully awake to their intellectual potentials.

Unfortunately, such a vision of the commonplace goes well beyond business as usual. Although classrooms and texts seem likely places for a rich language of thinking, the language in these places can be surprisingly sparse. For example, science texts at all grade levels, including college, tend to leave out terms that precisely identify intellectual processes — terms such as *explain*, *hypothesize*, *conclude*, and so on.[15] Further, as a result of a well-meaning but sometimes misguided effort to make learning easier and more palatable, teachers' talk can also be lean in language-of-thinking terminology. As Olson and Astington have pointed out, teachers will often ask students to construct explanations, make hypotheses, draw inferences, and so on without referring to these processes by name.[16] What happens instead? They use generic terms like *think* and *feel* and *opinion* to cover a vast range of more nuanced cognitive states and activities, as illustrated

by the first teacher in our Amelia Earhart example.

So Much More Than We Can Say

The language of thinking can tell a remarkably expressive story about the character of mental life. But even so, thinking is so much more than we can say in words. Imagine Picasso sketching studies for *Guérnica*. Or imagine Mozart composing a symphony in his head during a bumpy coach ride. Or imagine Einstein imagining himself riding along beside a light wave. How much of this is a matter of language at all, in any reasonable sense? How can the language of thinking do justice to the rich, multimodal character of thinking? Perhaps the language of thinking masks the true enterprise of thinking.

Certainly there is a risk here, so let us take its measure. First, it's important to clarify the issue. The language of thinking as used here means the language we use to talk *about* thinking — terms like *hypothesis, reason, option, imagination,* and so on. Language *about* thinking is mostly language in the familiar sense of words and sentences. But certainly people think *in* many other languages as vehicles — the languages of mathematics, or music, or visual images, if one can call these languages in a metaphorically extended sense. More properly, people think *in* many symbolic vehicles.

If anything, this point only sharpens the dilemma. It seems all the more true that the thinking we do involves so much more than we can say in words about that thinking. The language of thinking concerns only a part of the thinking: roughly its structural organization. Moreover, the language of thinking does not *do* the thinking. It simply offers a high-level, somewhat removed description of what is or could be or should be done.

In fairness though, the language of thinking is not special in this way. Language in general is in the business of "aboutness." The language of auto mechanics, politics, or dance is about a rich physical and experiential realm. Language never comes close to being a surrogate for the thing itself. Even language about language does not: it is a standard point of aesthetics that the language a critic uses to comment on the shortest poem does not provide anything like an adequate experience of the poem, nor is it meant to. Sometimes crit-

ics seek to evoke something of the experience of a fine concert through the expressive use of language, but without any expectation that readers should feel happy about staying at home and reading the newspaper instead of going to the concert. There is no reason that we should expect the language of thinking to provide any more of a surrogate for thinking than the language of anything else does for its referent.

Does it follow that the language of thinking cannot illuminate or guide? No such conclusion holds in other cases. Even though the language of auto mechanics stands at considerable remove from fixing a car, it is patently useful in instruction, in collaboration among mechanics, and in talking oneself through problems — reminding oneself what one knows, what might be going on, and what one might try to do about it. Likewise, the language of thinking can say things that are useful to a scientist or artist or auto mechanic, as well as to students in any of those domains. Questions from oneself, a partner, or coach — such as "Is there a not-so-conventional, more creative option here?" or "Are you making any risky assumptions here, and can you get away with them?" or "What reason do you have to believe that?" — make sense and do good service for all three (or for most anyone engaged in thinking).

Although thinking involves much more than we can say, we would have far less access to that "more" without the language of thinking. Another idea from aesthetics emphasizes that language commonly has a pointing function. The use of language in the presence of a work of art does not substitute for the work but cues us to see or hear things we would otherwise miss. In classrooms or offices, seminars or senates, far from standing between us and our thinking, the language of thinking helps us discern more clearly and deeply what we are doing, where we are going, and where we might better go when we think.

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